



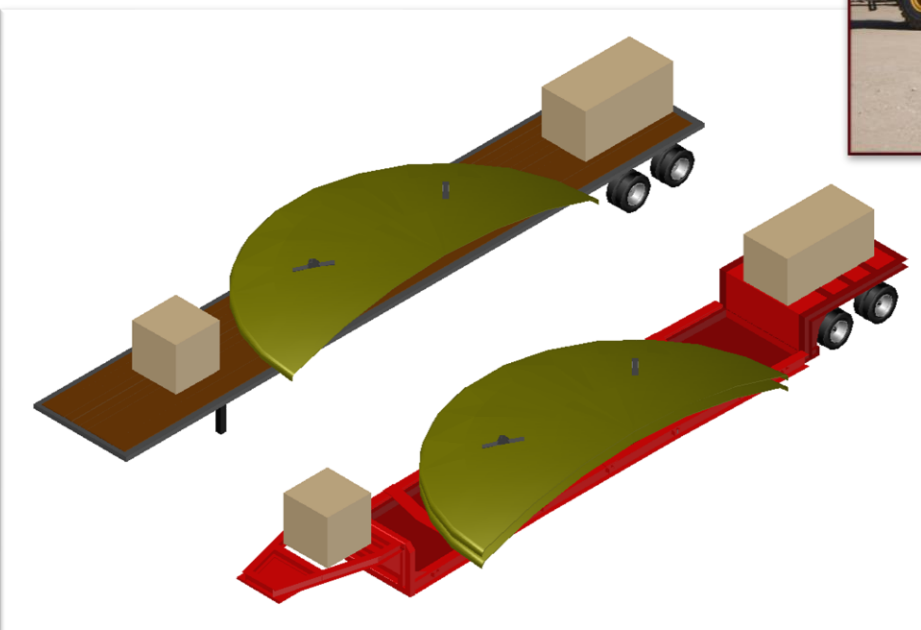
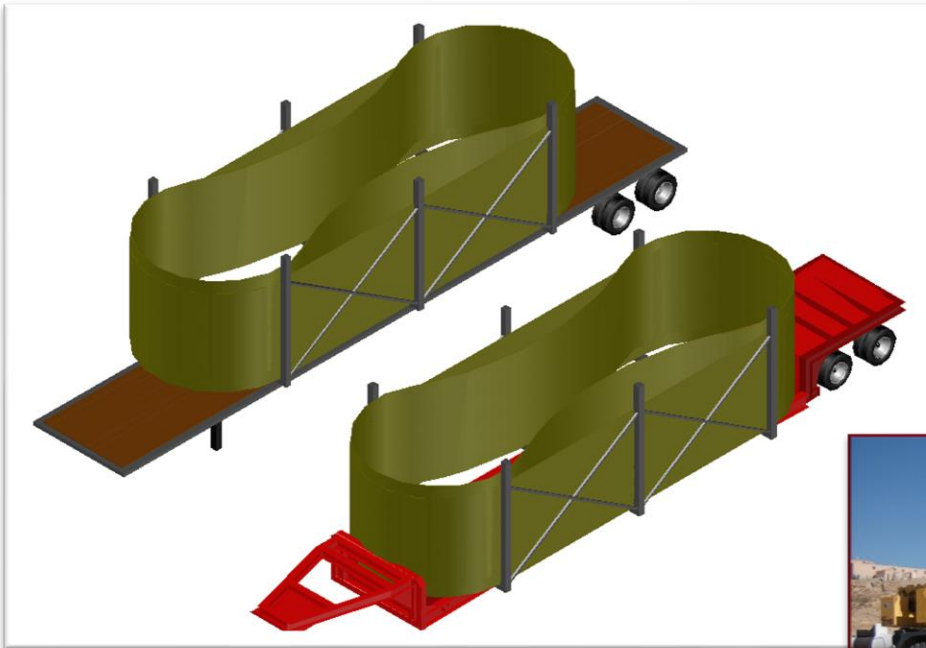
A GUIDE TO BUILDING A FIBERGLASS REINFORCED PLASTIC FIELD ERECTED TANK

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“In tank manufacturing there are too many variations to describe every aspect. This guide only demonstrates a standard tank build”.

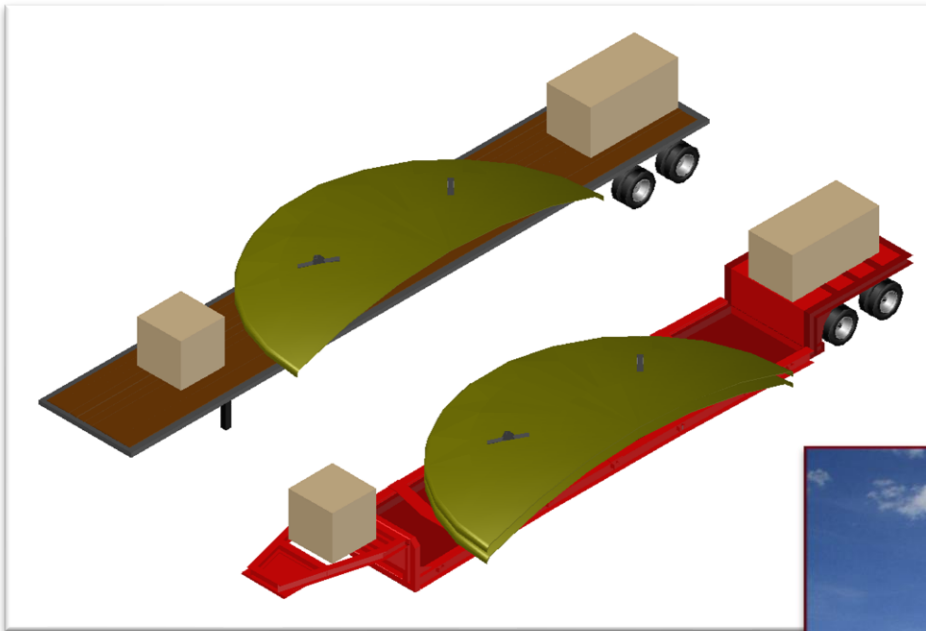
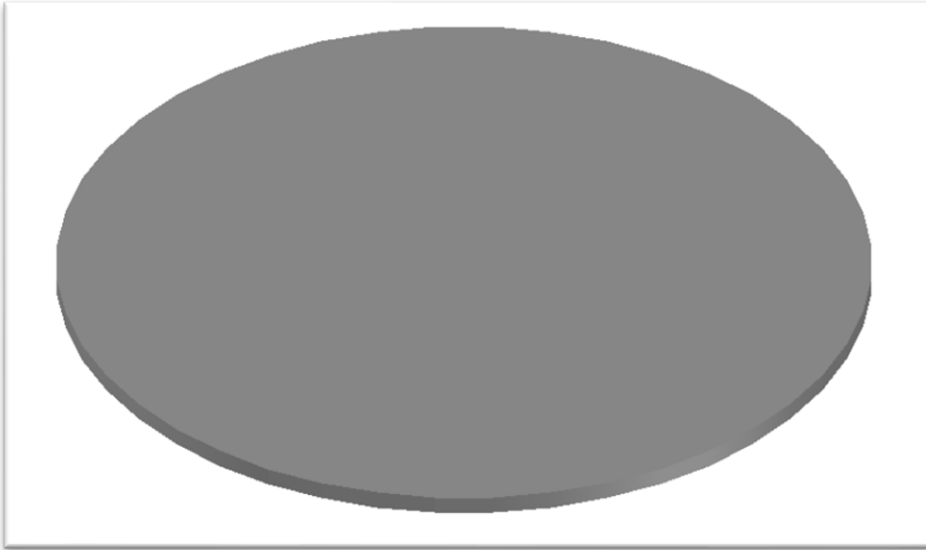
OFF-LOADING OF PARTS

- Tank mod parts arrive in a steel cradle aboard either a flatbed or drop deck trailer.
- The cradle is off-loaded onto the ground at a pre-determine lay-down area near the tank pad with the use of a crane sized to the weight and pick radius.
- The dish, bottoms and material crates are on the deck aboard either a flatbed or drop deck trailer.
- The parts are off-loaded by either a crane or telehandler forklift. They will be placed in the area where they will be installed.



OFF-LOADING OF PARTS

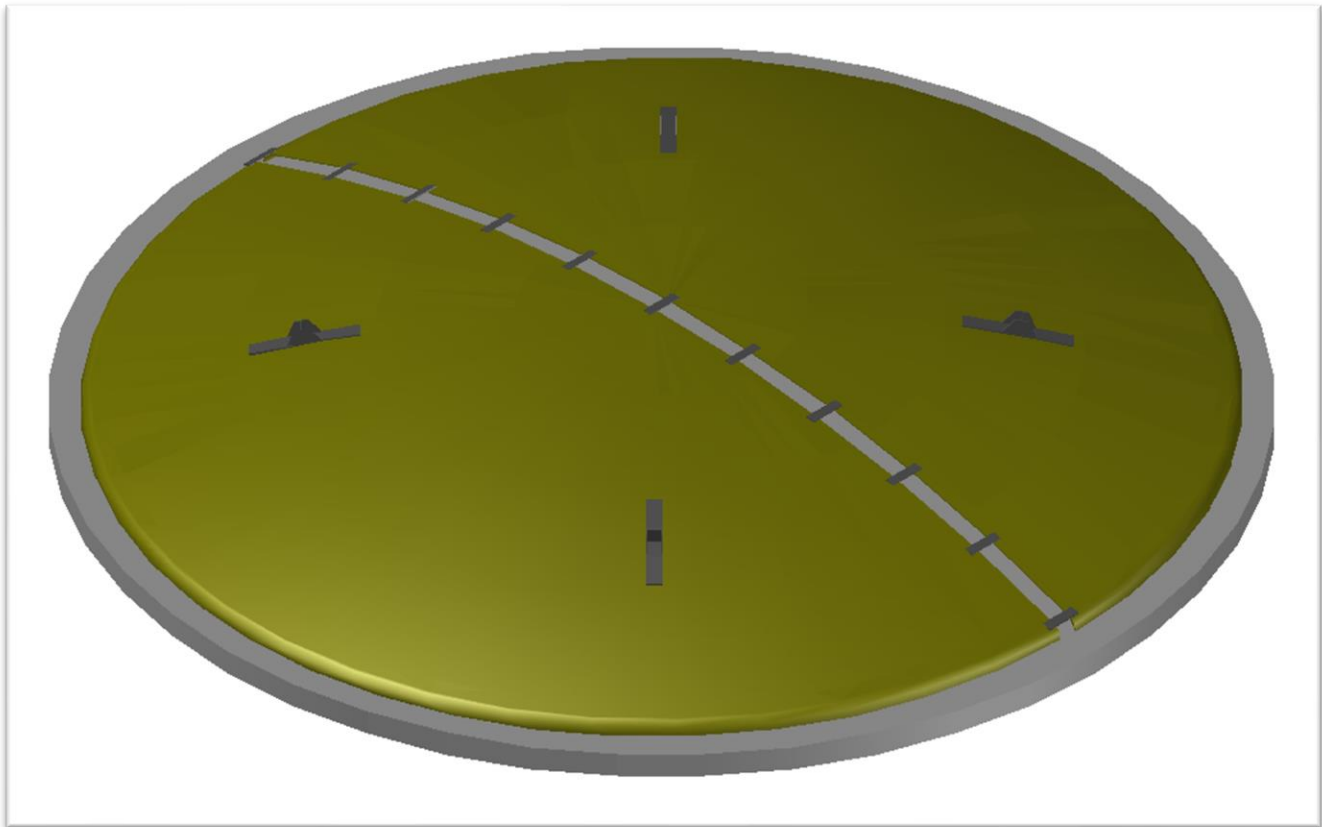
- The tank pad is prepped to receive the dish halves.
- The dish halves are removed from the trailer and placed on the pad with the use of a crane or telehandler.





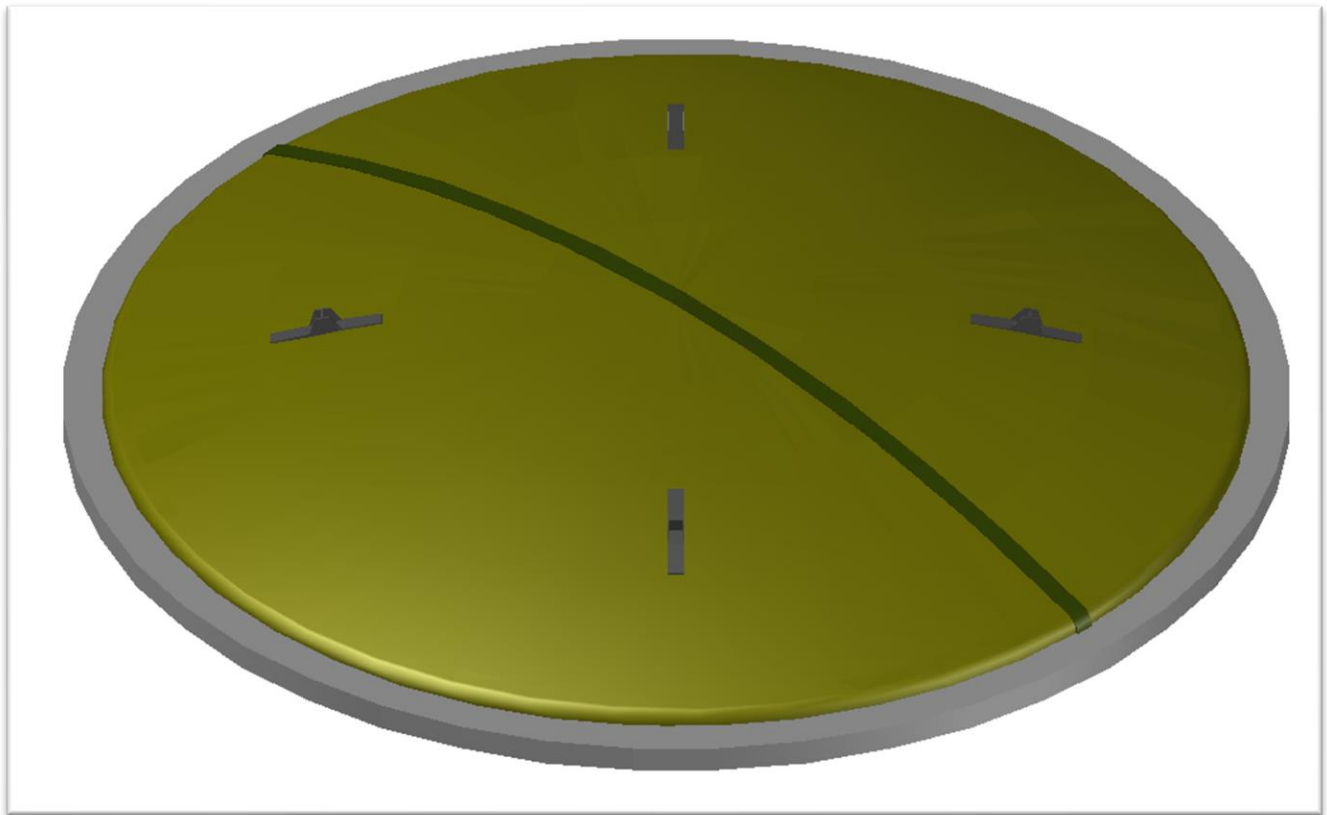
DISH ASSEMBLY AND BONDING

- The dish halves are set on the tank pad or any level surface for fabrication.
- Shoehorns are attached to the dish halves to ensure the alignment of the two halves are correct.
- The halves are measured to ensure correct diameter.
- Option:
 - The dish can be delivered in multiple variation of pieces. Typical dish parts come in 2 to 3 pieces. Larger diameter tank may have multiple pie shaped parts.



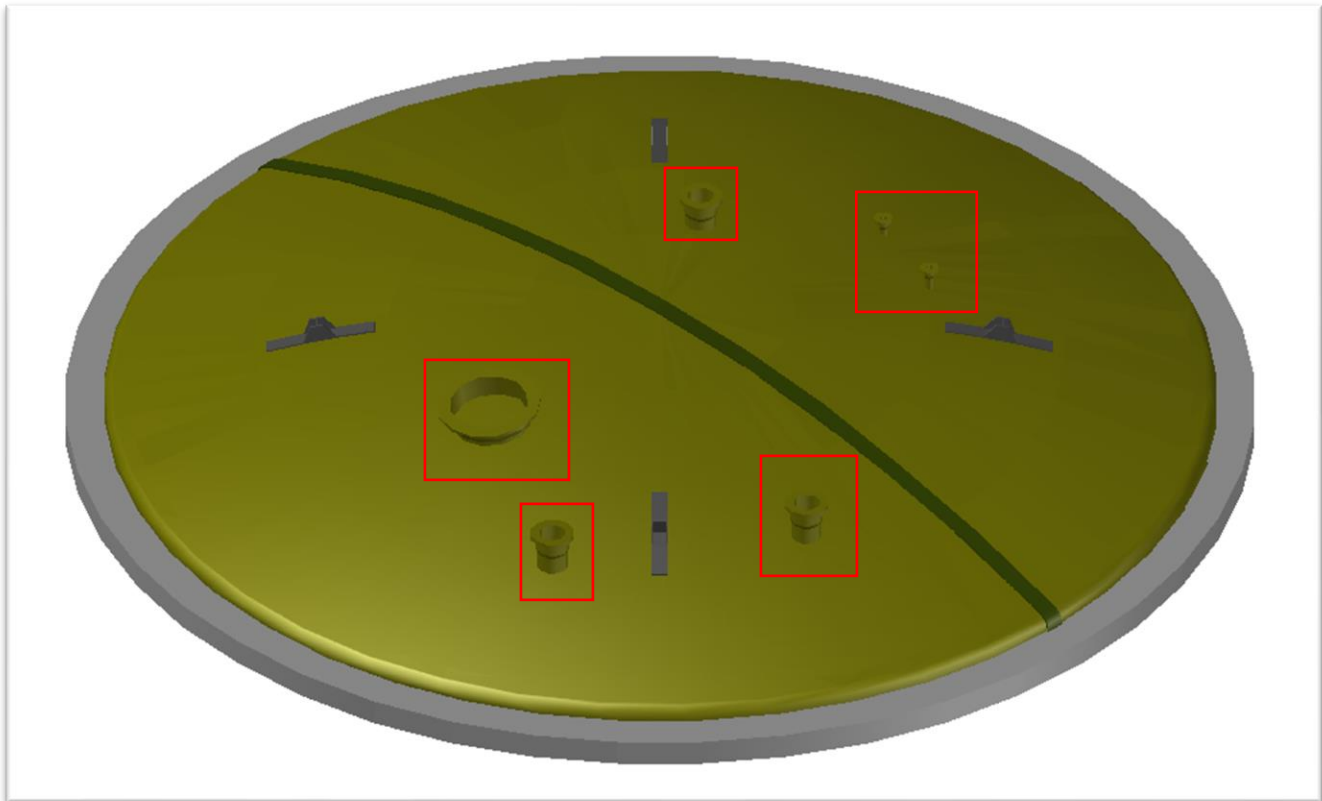
DISH ASSEMBLY AND BONDING

- The dish halves are hot patched together.
 - The term hot patch is a small fiberglass/resin patch placed in strategic locations between the shoehorns that secures the part until the final bonds can be applied.
- The shoehorns are removed.
- The dish seam is then bonded to the required thickness and width per specification.



DISH ASSEMBLY AND BONDING

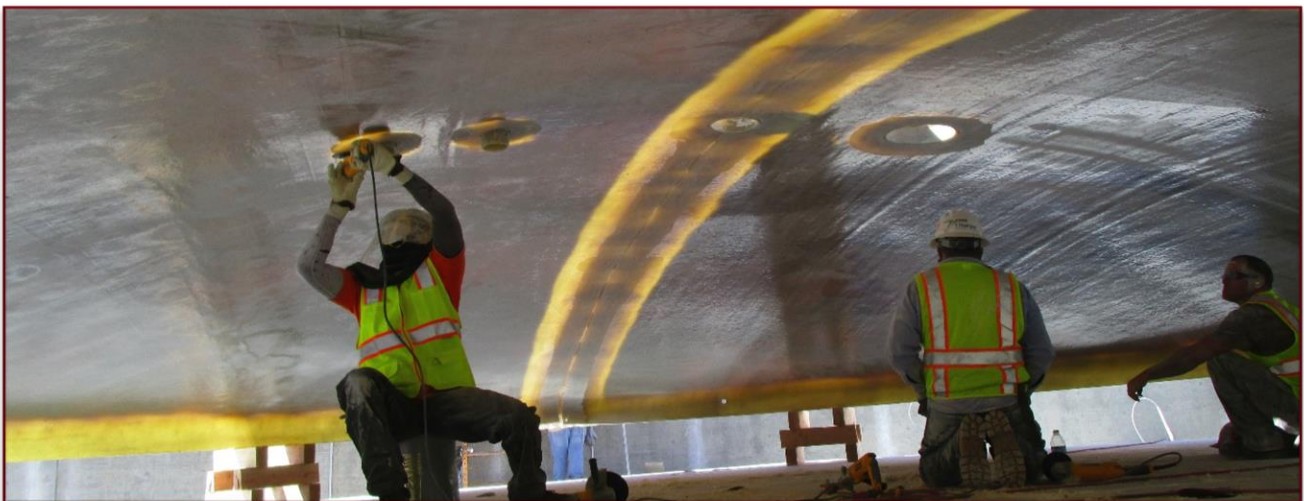
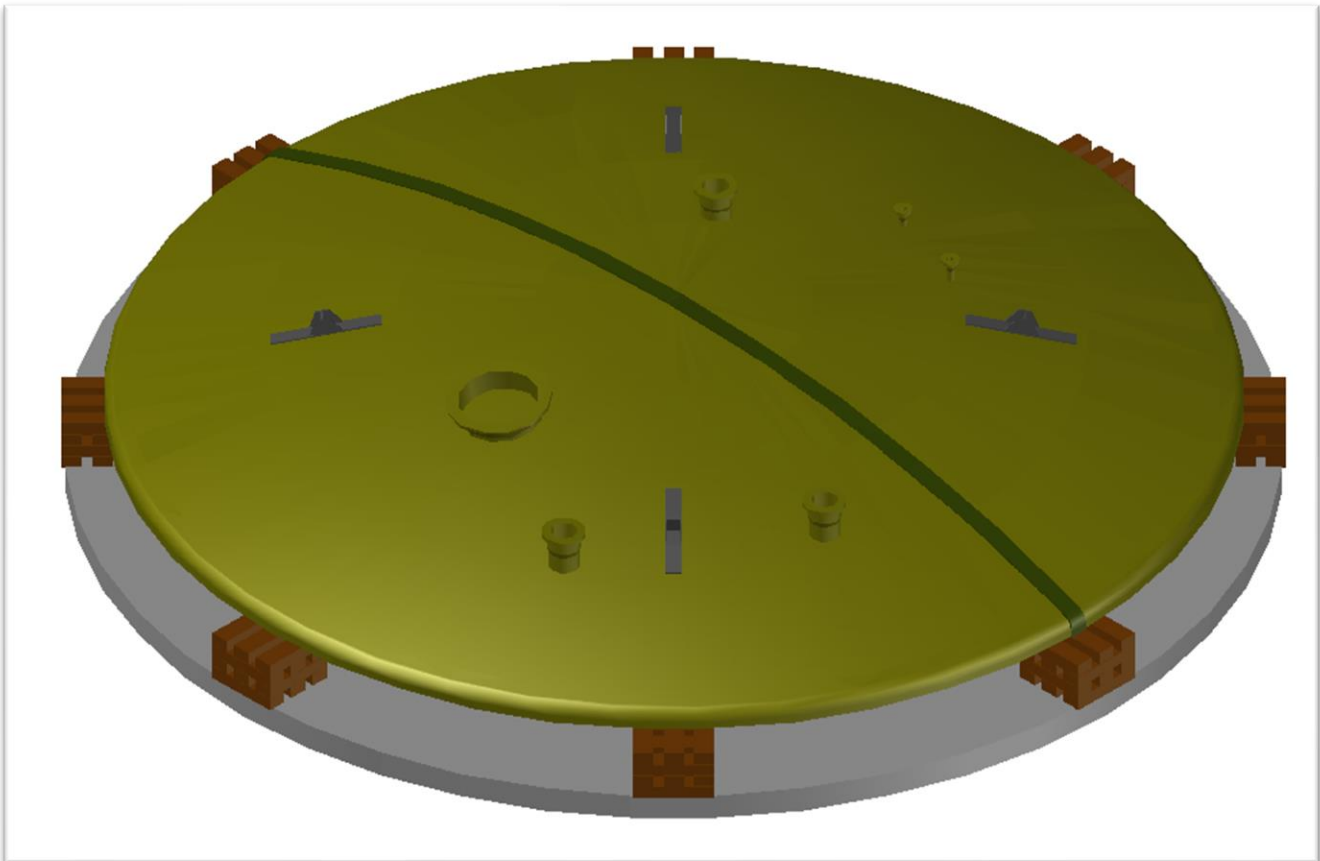
- If the dish requires fittings or clips installed:
- The dish will be measured to identify the orientation of each fitting or clip to be installed.
- The dish will be measured from center the correct distance the fitting or clip will be installed.
- Holes will be drilled and/or cut to the size of the fitting to be installed.
- The fittings will be set to the correct projection height and hot patched.
- Type I fittings will be cut to length, Type II fittings will be cut flush to dish surface.
- Reinforcement bonds will be made to the fittings and clips per the specifications.
- Internal seal bonds will be made inside of dish, if required.





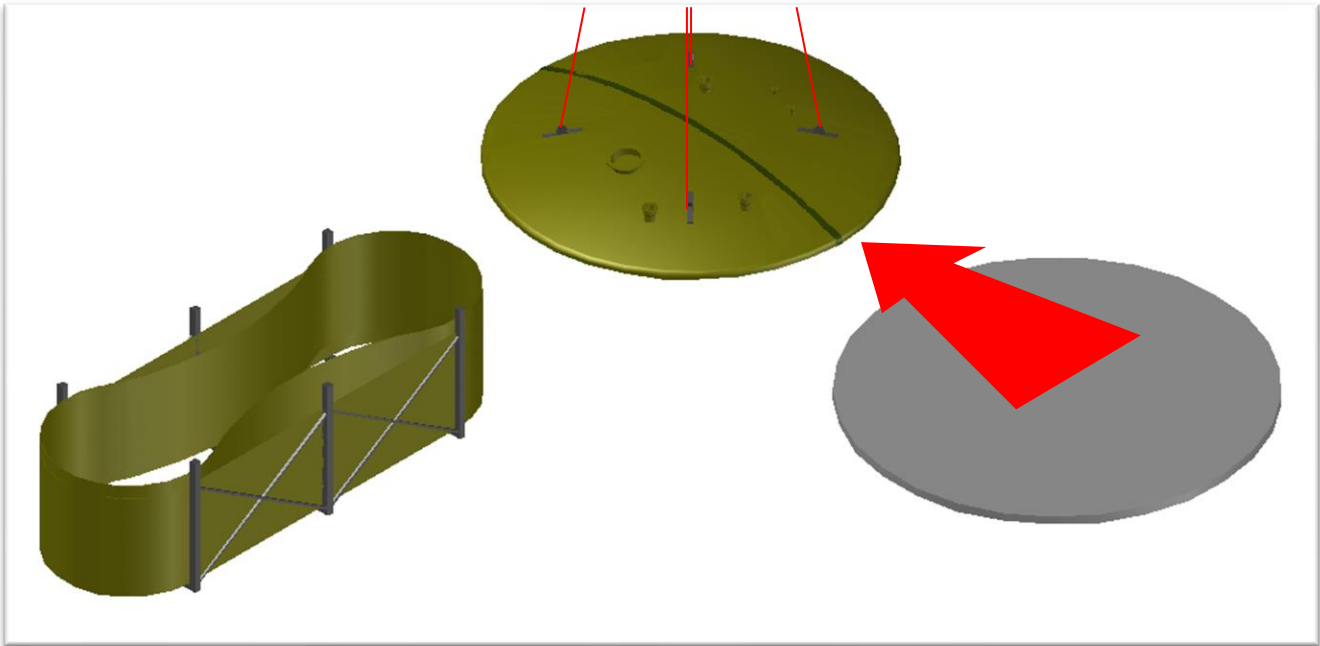
DISH ASSEMBLY AND BONDING

- The completed dish is set on cribbing to allow ingress to the inside seal bond.
- The cribbing is generally 6"x6"x24" wood that is inter-laced stacked to a height to allow the fabricator adequate room to work under the mod and safely egress as needed.

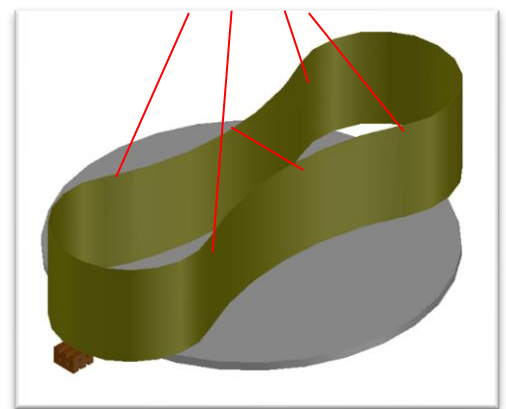
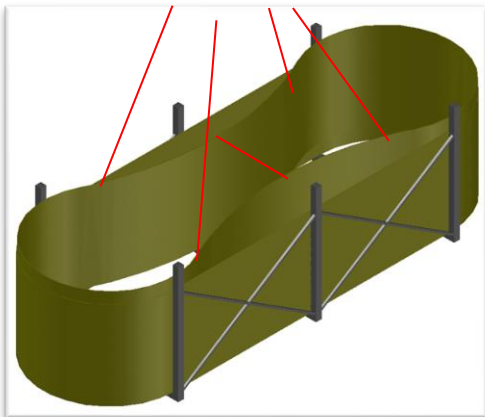


MOD ASSEMBLY AND BONDING

- The completed dish will be moved off the pad into a lay-down area for short-term storage using a crane.

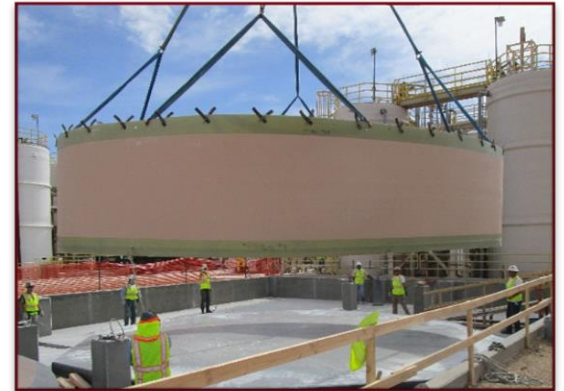
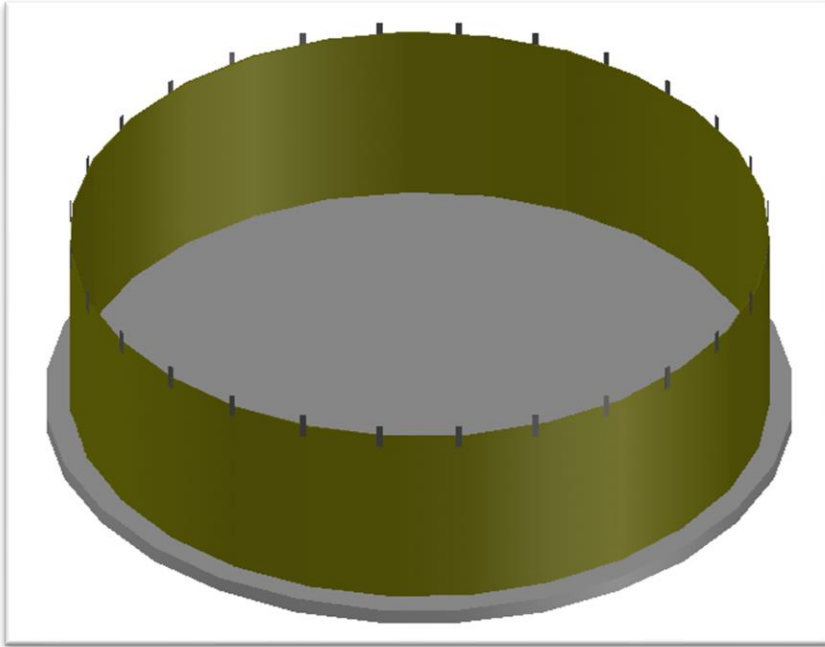


- Come-A-Longs will be secured to the Top Mod inside of the steel cradle to pull the mod out of its nested position.
- The Top Mod of the tank will be removed from the steel cradle of parts using a crane.
- The mod will be set down on the pad, or any other flat surface, on top of cribbing on the long end.
- The come-a-longs will be released to allow the mod to round out.

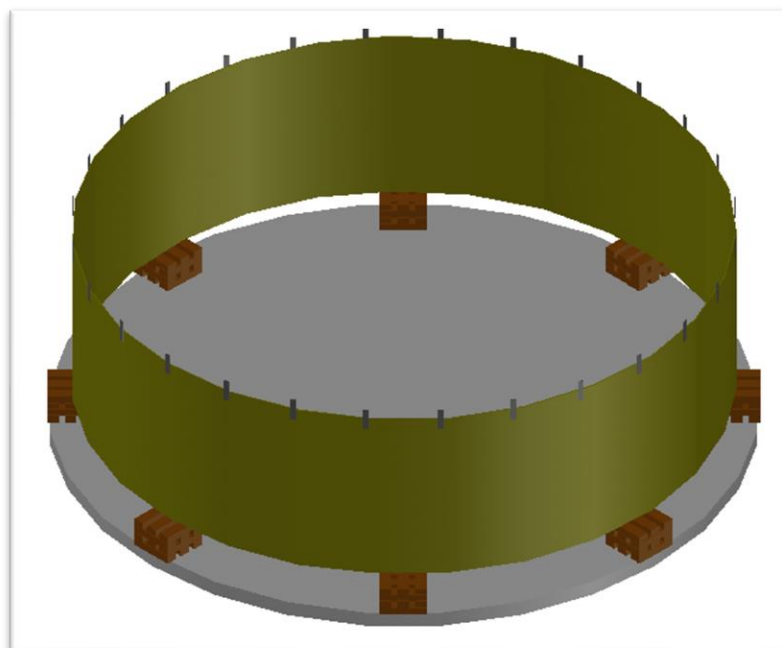


MOD ASSEMBLY AND BONDING

- After the top mod is rounded, shoehorns are attached to the top of the mod to ensure the alignment of the mod and the dish are correct.

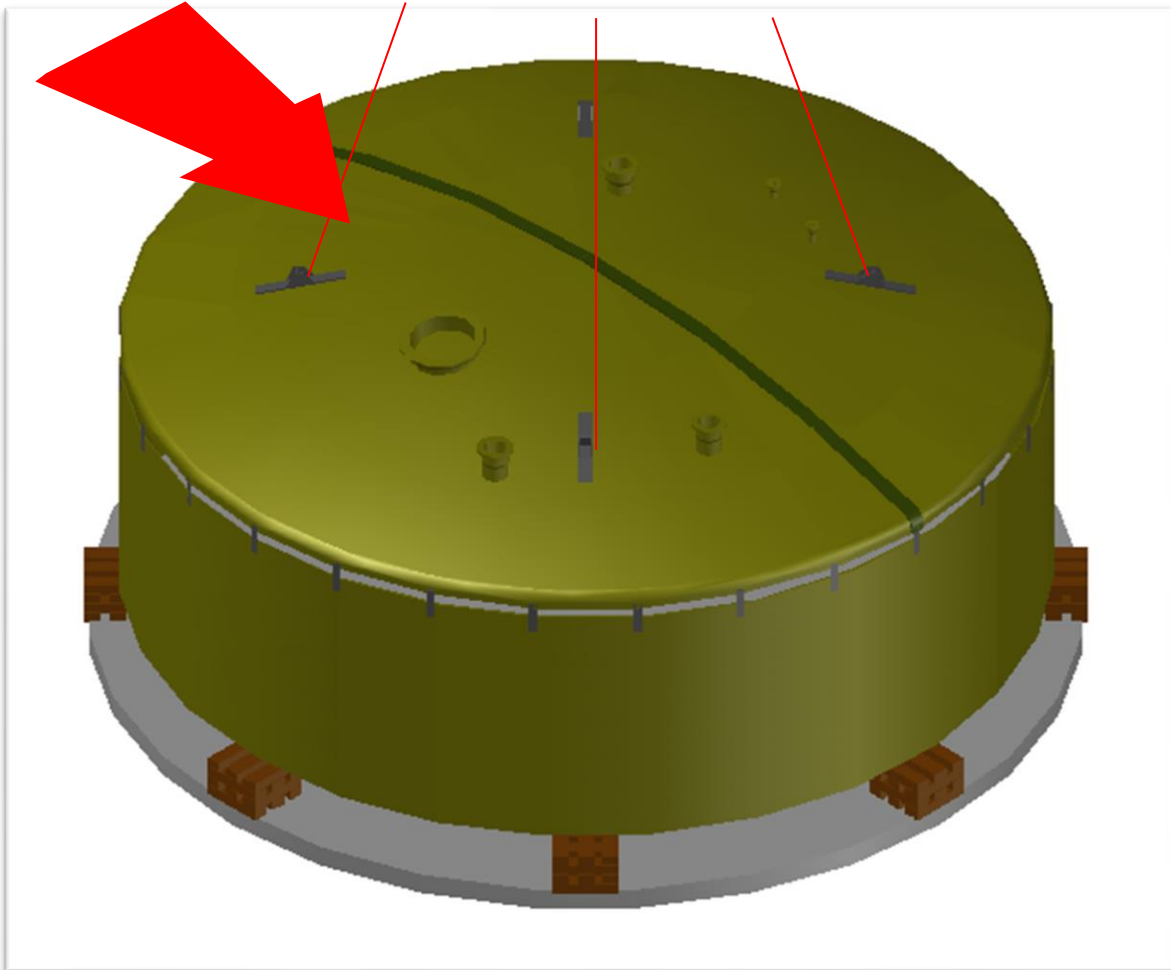


- The top mod is set on cribbing to allow ingress to the inside seal bond.
- The cribbing is generally 6"x6"x24" wood that is inter-laced stacked to a height to allow the fabricator adequate room to work under the mod and safely egress as needed.



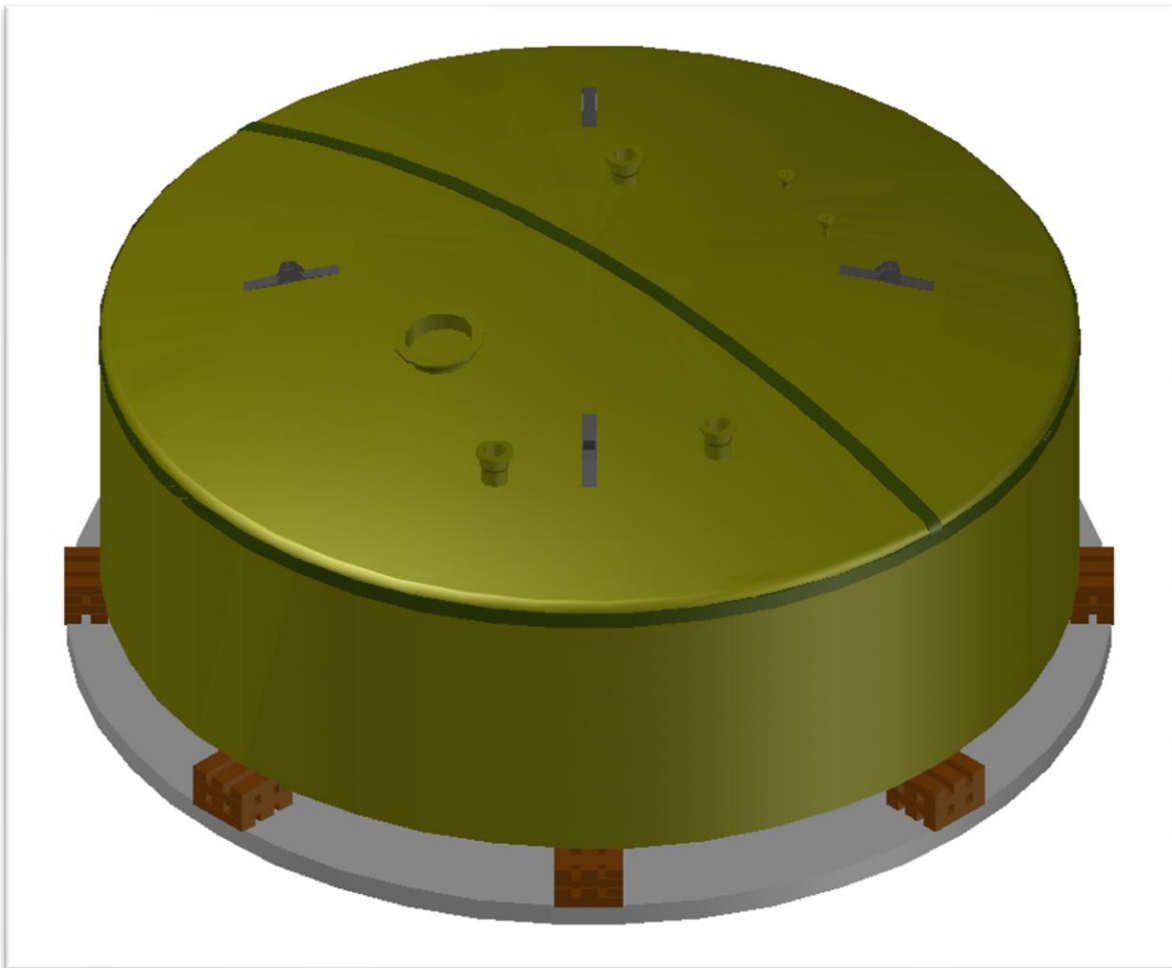
MOD ASSEMBLY AND BONDING

- The dish is flown in from the lay-down area using a crane.
- The dish is aligned to the top mod's shoe horns.
- The dish and top mod are hot patched together.
 - The term hot patch is a small fiberglass/resin patch placed in strategic locations between the shoe horns that secures the part until the final bonds can be applied.



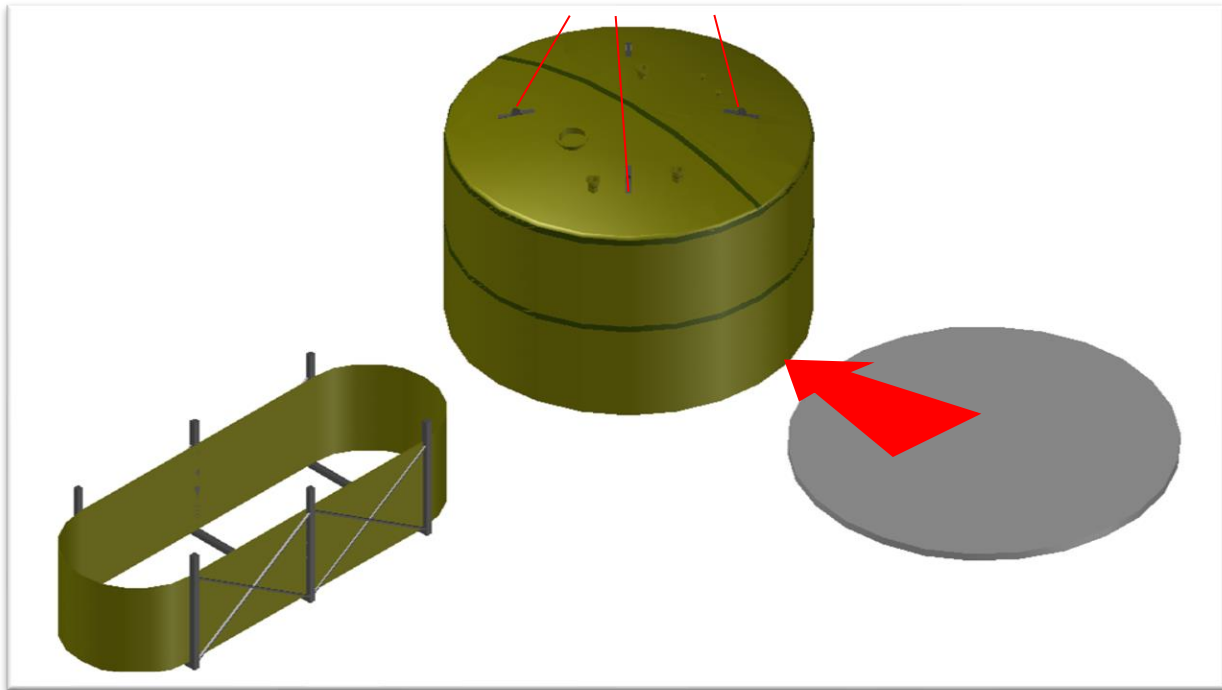
MOD ASSEMBLY AND BONDING

- The shoehorns are removed.
- The dish to top mod seam is then bonded to the required thickness and width per specification both outside and inside of the dish and top mod.
- Option: Any fittings and clips can be installed at this time on the top mod straight shell or can elect to be left until the entire tank is built.

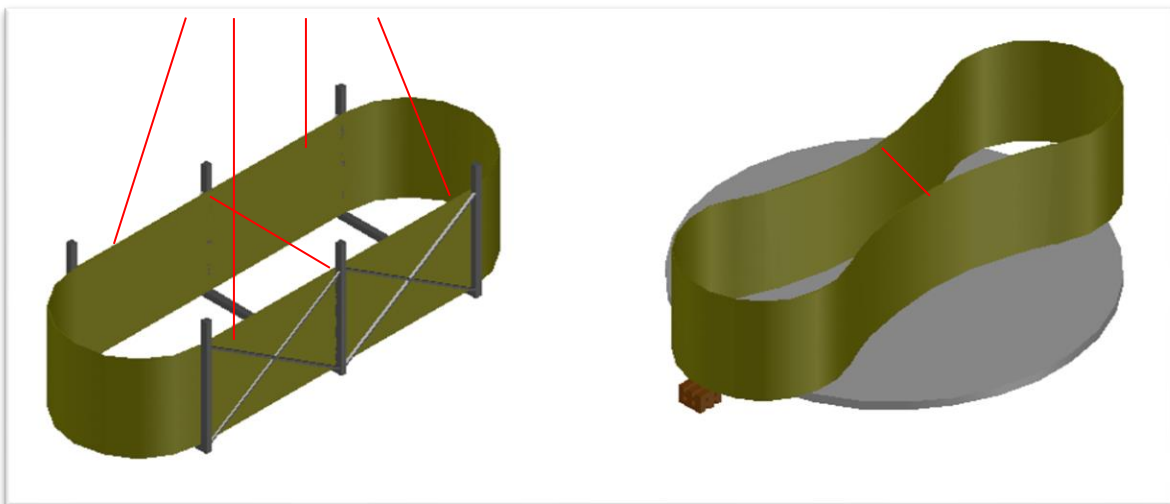


MOD ASSEMBLY AND BONDING

- The completed dish and top mod will be moved off the pad into a lay-down area for short-term storage using a crane.

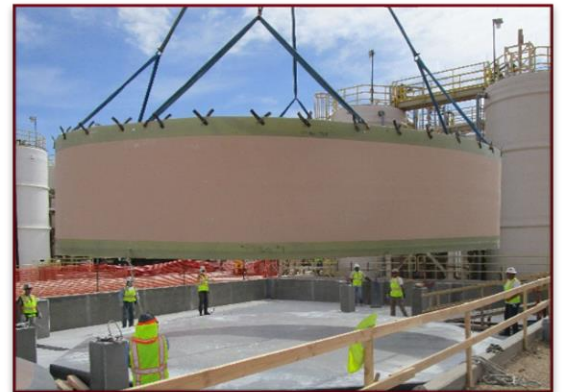
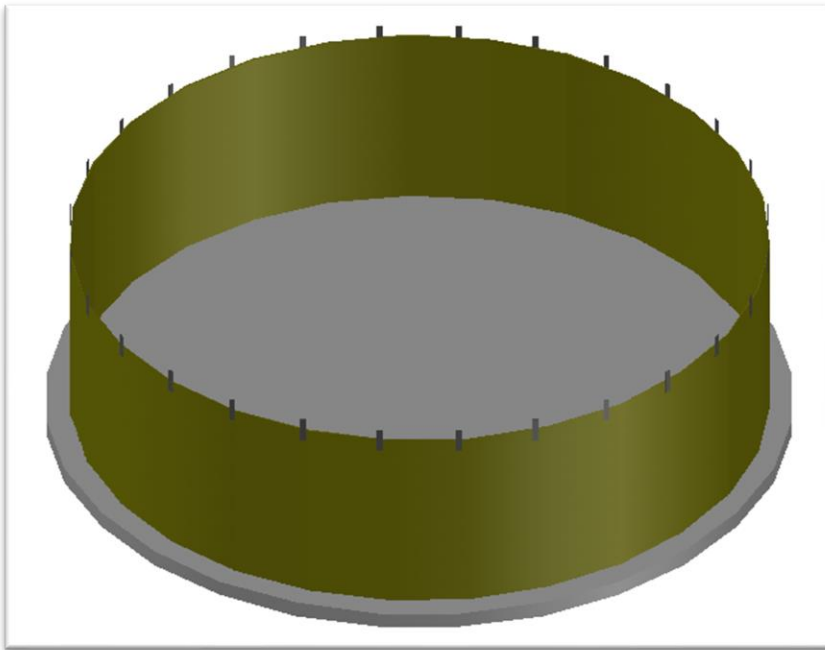


- Come-A-Longs will be secured to the Middle Mod inside of the steel cradle to pull the mod out of its nested position.
- The Middle Mod of the tank will be removed from the steel cradle of parts using a crane.
- The mod will be set down on the pad, or any other flat surface, on top of cribbing on the long end.
- The come-a-longs will be released to allow the mod to round out.

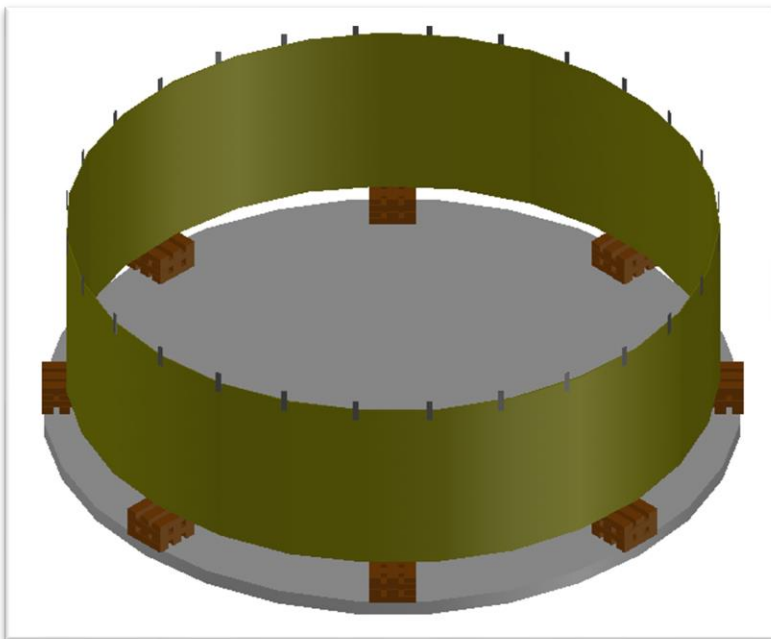


MOD ASSEMBLY AND BONDING

- After the middle mod is rounded, shoehorns are attached to the top of the mod to ensure the alignment of the mod and the dish are correct.

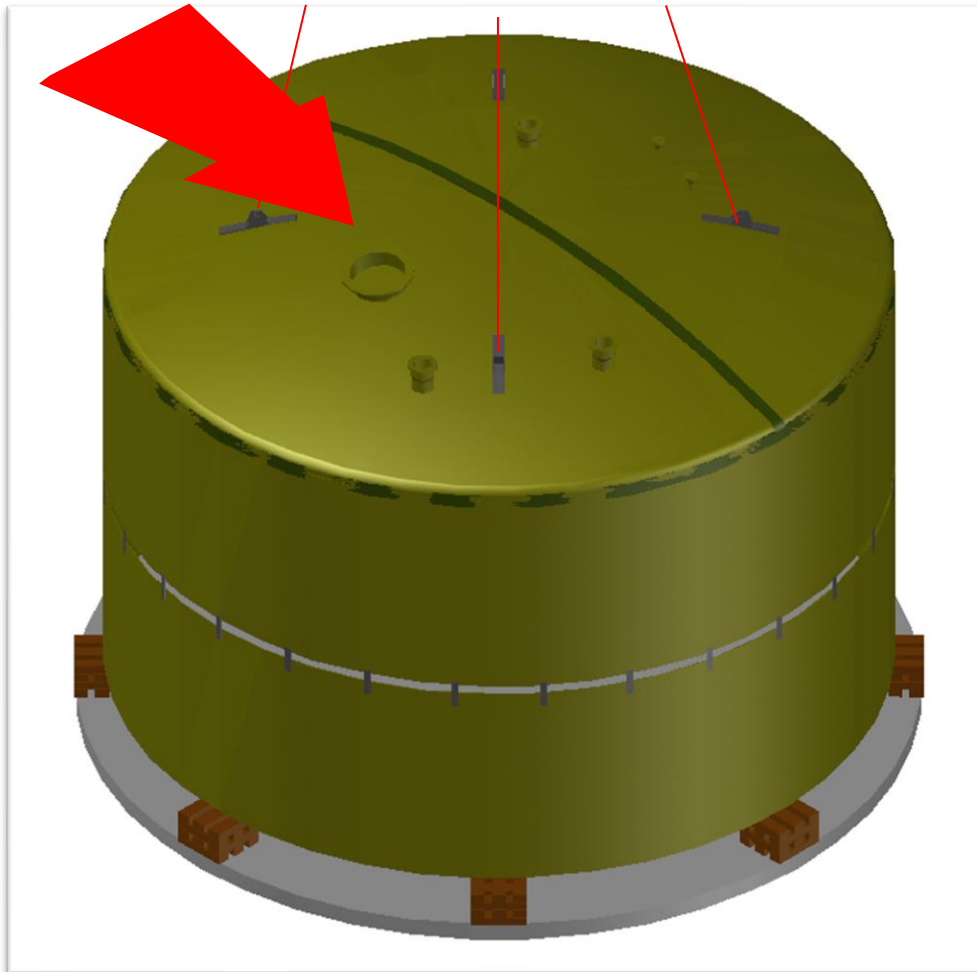


- The top mod is set on cribbing to allow ingress to the inside seal bond.
- The cribbing is generally 6"x6"x24" wood that is inter-laced stacked to a height to allow the fabricator adequate room to work under the mod and safely egress as needed.



MOD ASSEMBLY AND BONDING

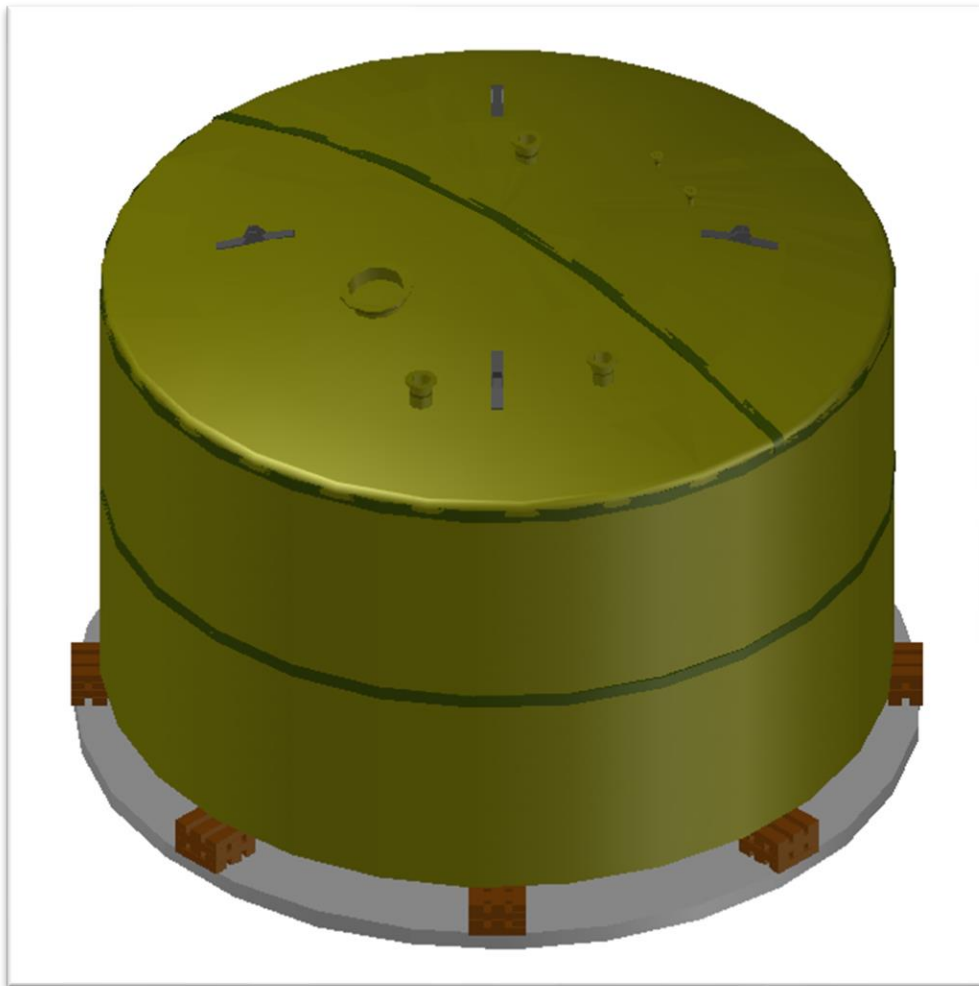
- The dish and top mod are flown in from the lay-down area using a crane.
- The dish and top mod are aligned to the middle mod's shoe horns.
- The dish, top mod and middle mod are hot patched together.
 - The term hot patch is a small fiberglass/resin patch placed in strategic locations between the shoe horns that secures the part until the final bonds can be applied.





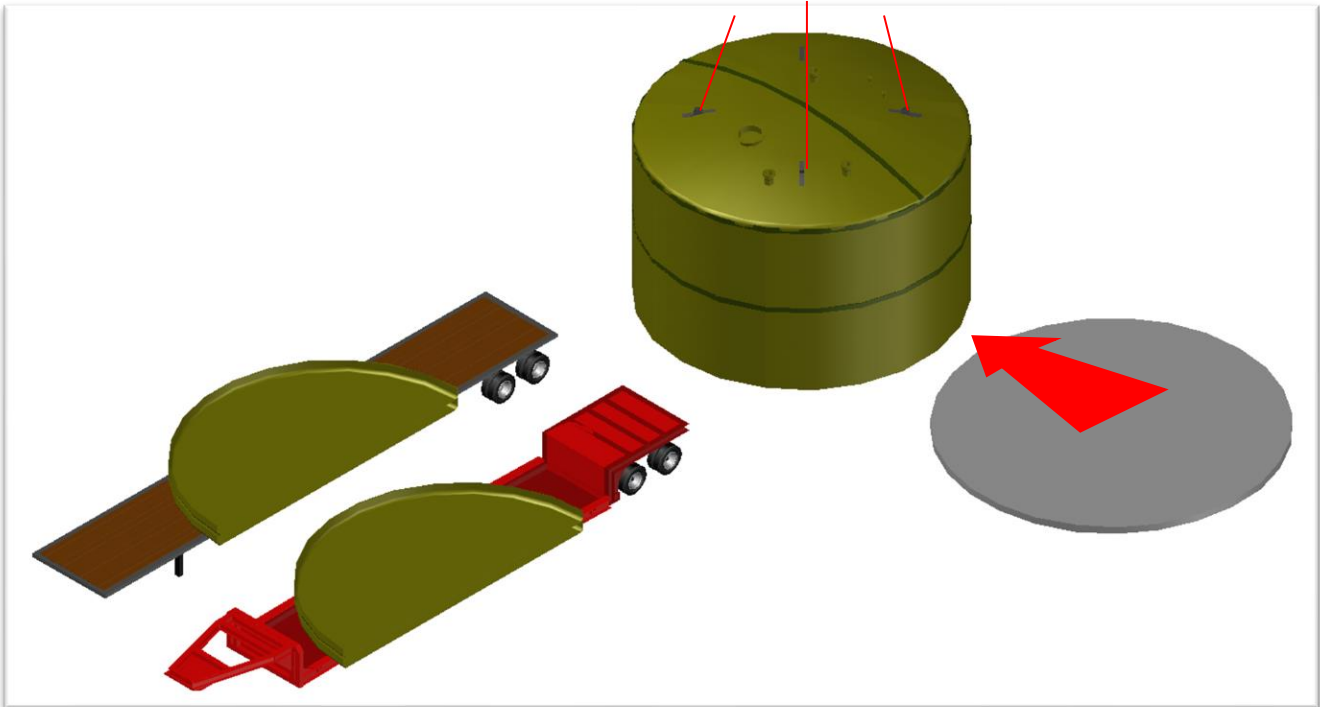
MOD ASSEMBLY AND BONDING

- The shoehorns are removed.
- The top mod to middle mod seam is then bonded to the required thickness and width per specification both outside and inside of the top mod and middle mod.
- Option: Any fittings and clips can be installed at this time on the middle mod straight shell or can elect to be left until the entire tank is built.

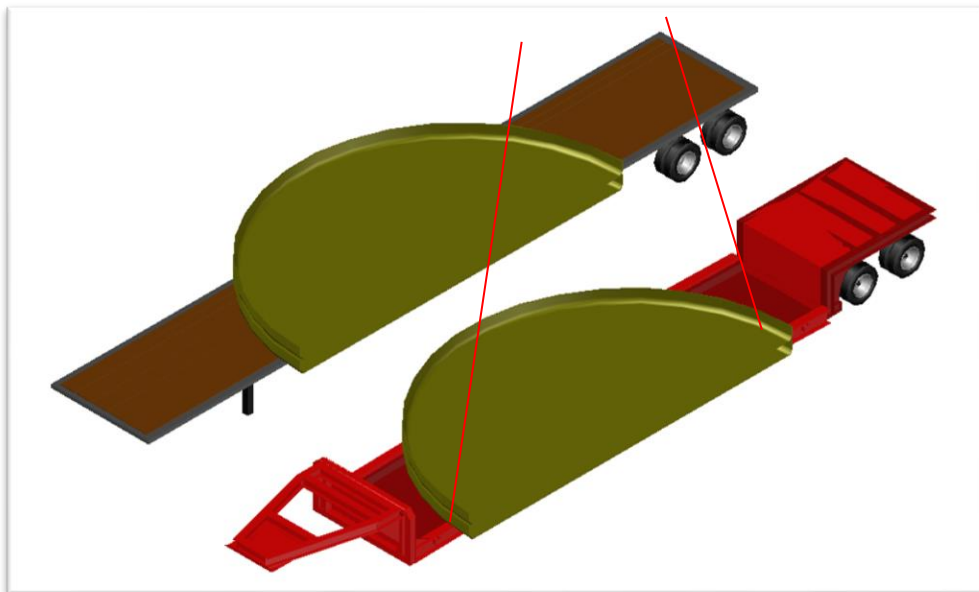


BOTTOM ASSEMBLY AND BONDING

- The completed dish, top and middle mod will be moved off the pad into a lay-down area for short-term storage using a crane.



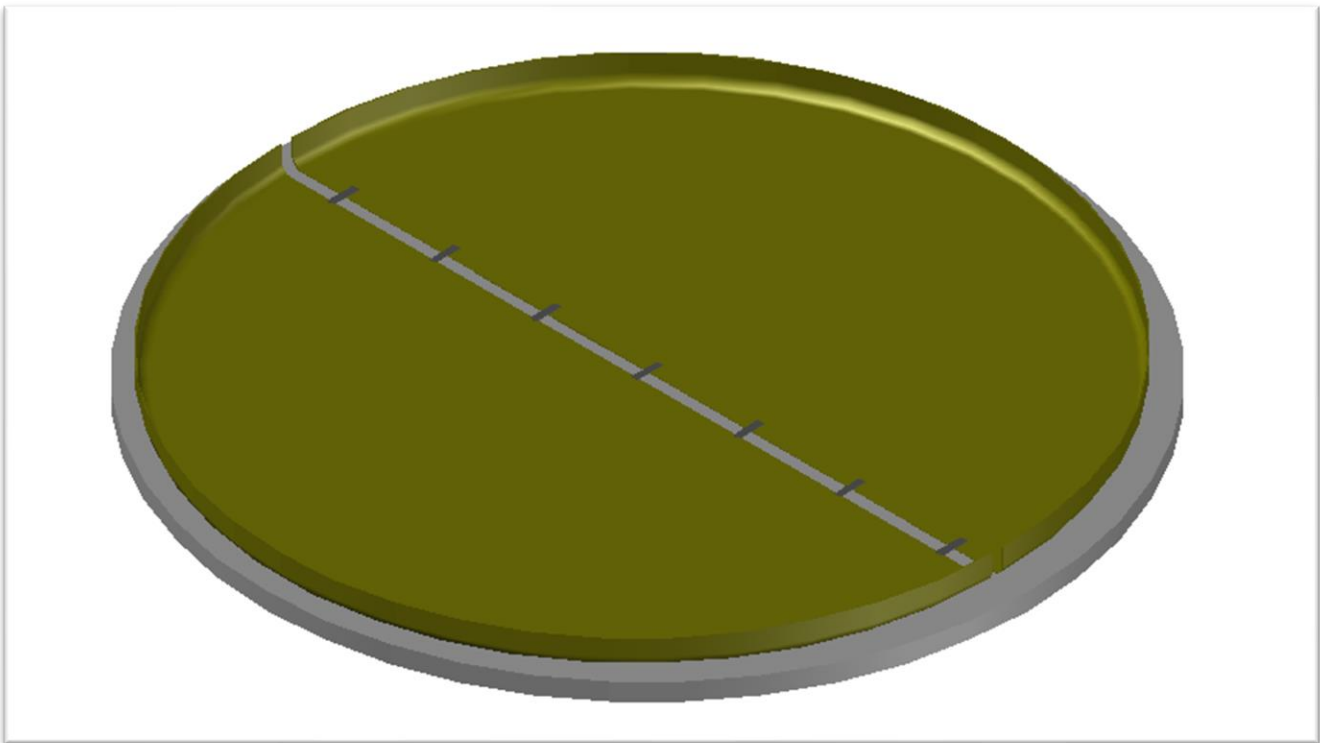
- The bottom halves are removed from the truck and placed on the pad with the use of a crane or telehandler.





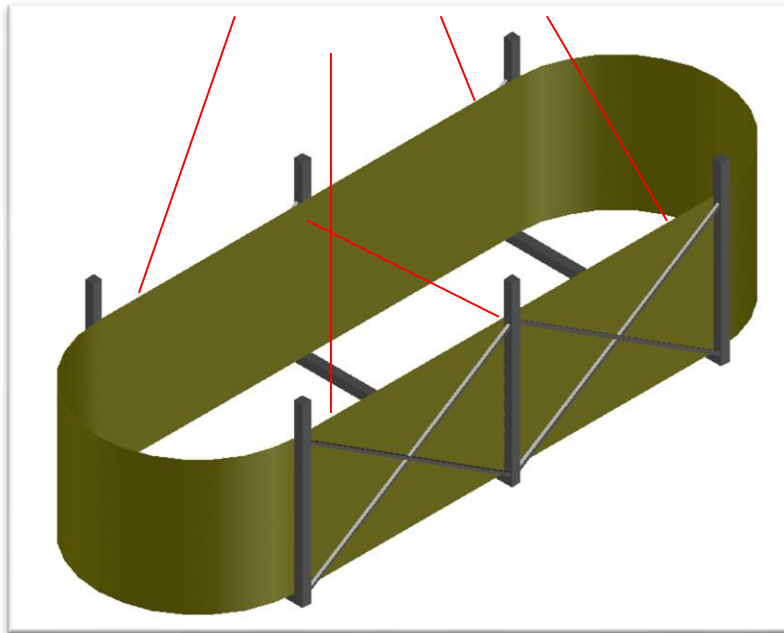
BOTTOM ASSEMBLY AND BONDING

- The bottom halves are set directly on the pad.
- Shoehorns are attached to the bottom halves to ensure the alignment of the two halves are correct.
- The halves are strapped to ensure correct diameter.
- Option:
 - The bottom can be delivered in multiple variation of pieces. Typical bottom parts come in 2 to 3 pieces.
 - The most common style of tank bottoms are hard knuckle and flex knuckle bottoms.

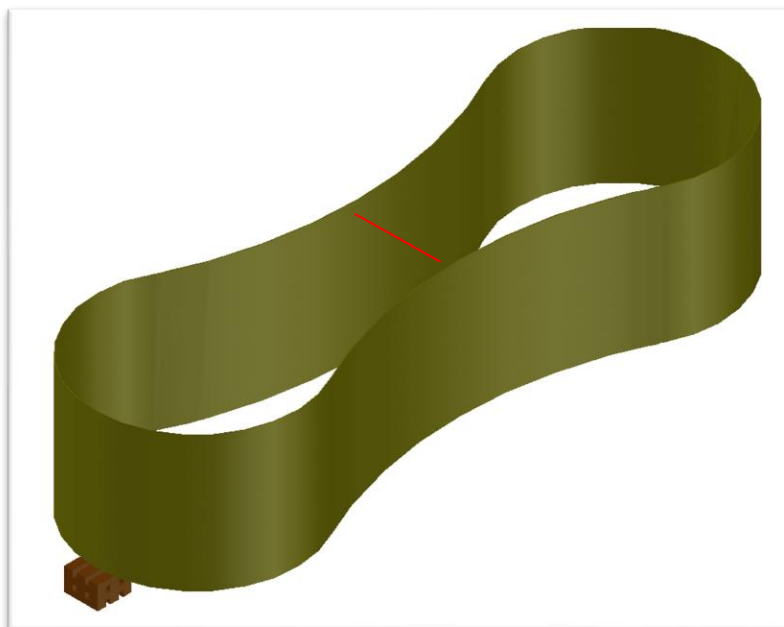


BOTTOM ASSEMBLY AND BONDING

- Come-A-Longs will be secured to the Bottom Mod inside of the steel cradle to pull the mod out of its nested position.
- The Bottom Mod of the tank will be removed from the steel cradle of parts using a crane.

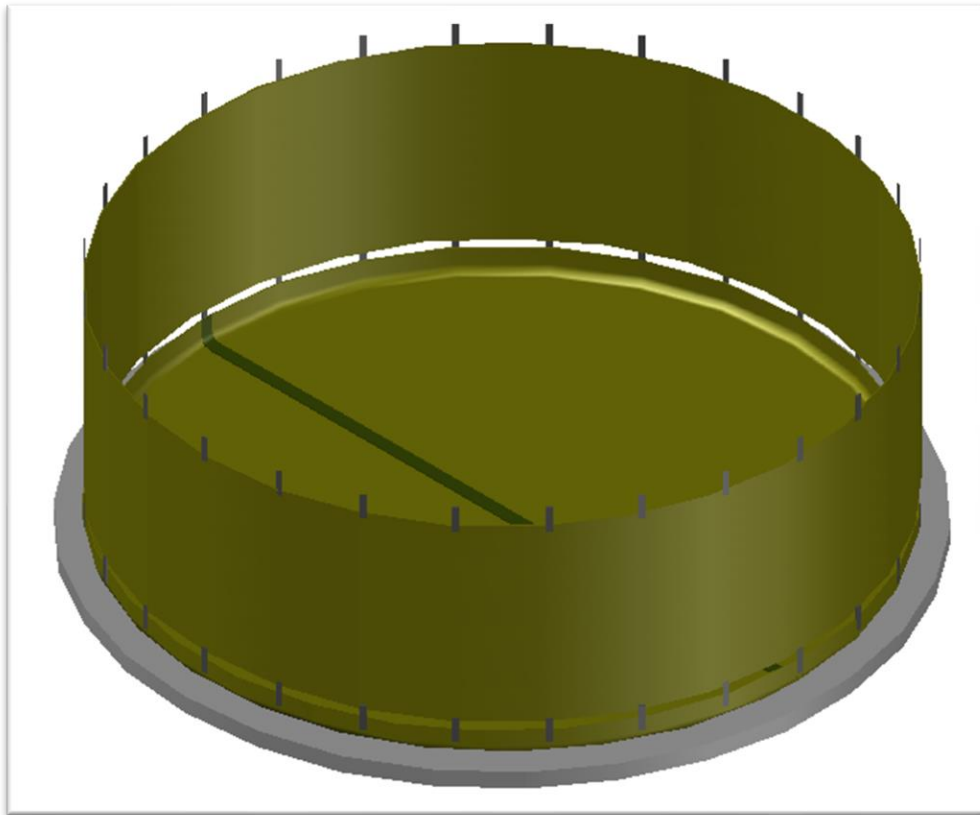


- The mod will be set down on a flat surface, with cribbing on the long end to de-oblate.
- The come-a-longs will be released to allow the mod to round out.

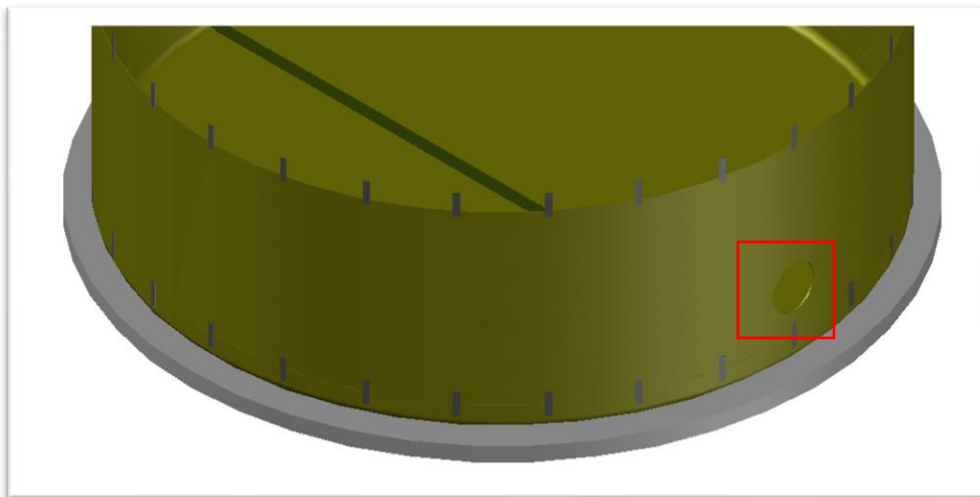


BOTTOM ASSEMBLY AND BONDING

- The bottom mod is set on the tank bottom, inside of the shoehorns.
- Shoehorns are attached to the top of the mod to ensure the alignment of the mod and the dish are correct.

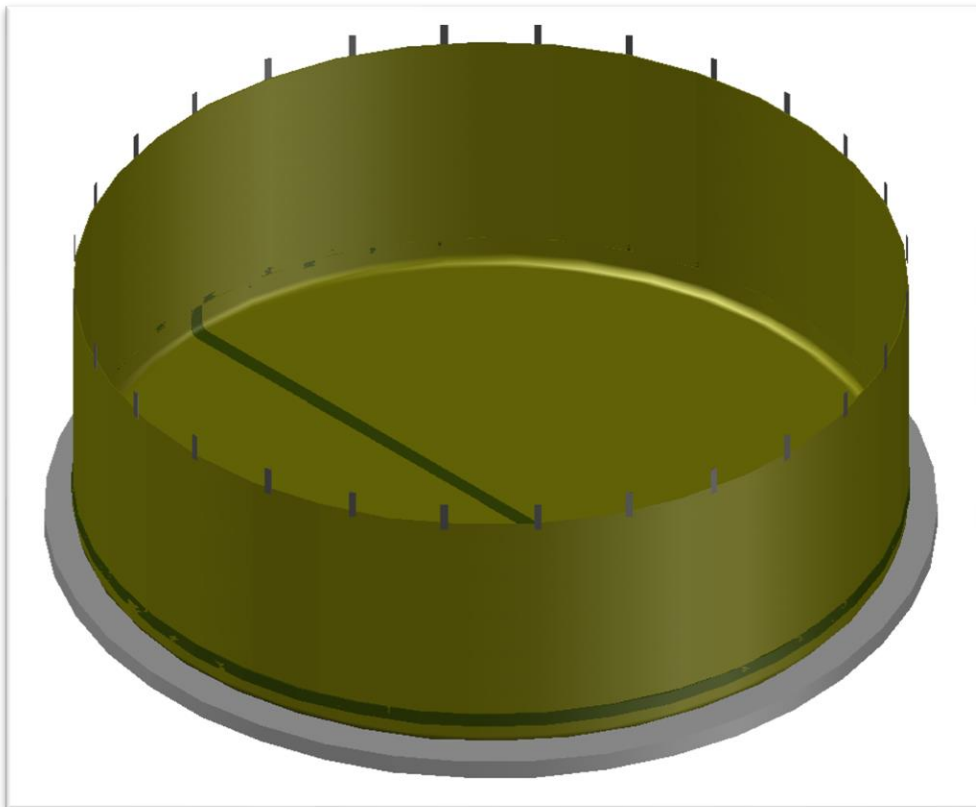


- The manway hole will be marked for orientation and elevation.
- The hole will be cut out to allow ingress to the inside of the tank for bonding.



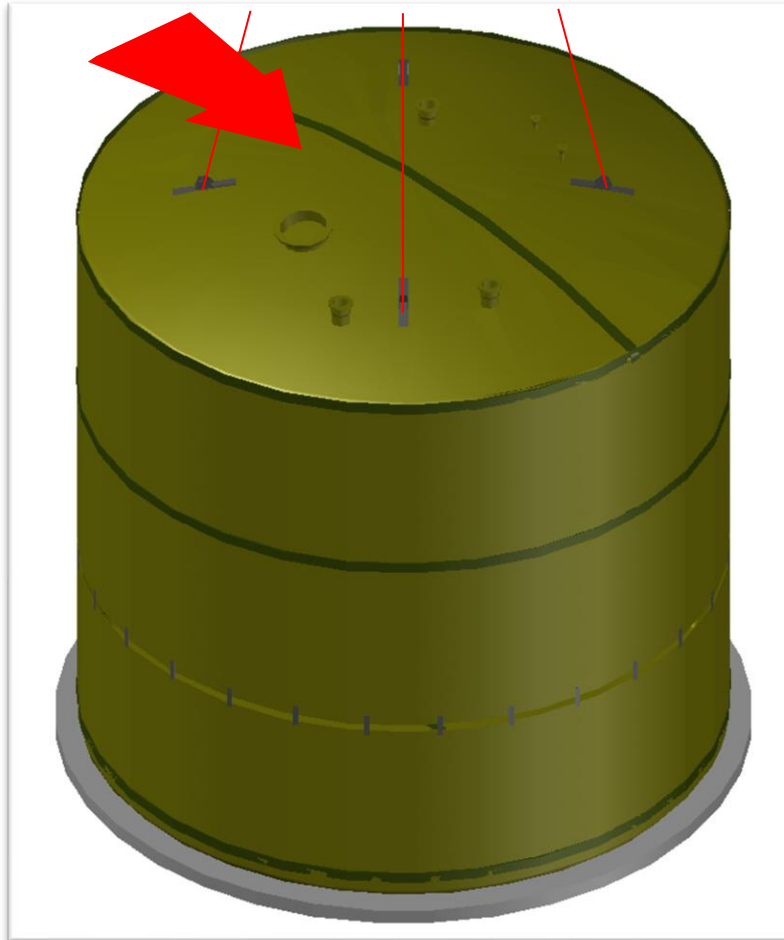
BOTTOM ASSEMBLY AND BONDING

- The bottom-to-bottom mod will be hot-patched together.
 - The term hot patch is a small fiberglass/resin patch placed in strategic locations between the shoe horns that secures the part until the final bonds can be applied.
- The shoe horns are removed.
- The bottom-to-bottom mod seam is then bonded to the required thickness and width per specification both outside and inside of the top mod and middle mod.



BOTTOM ASSEMBLY AND BONDING

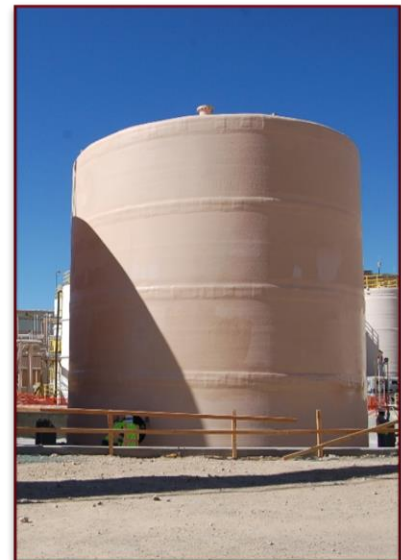
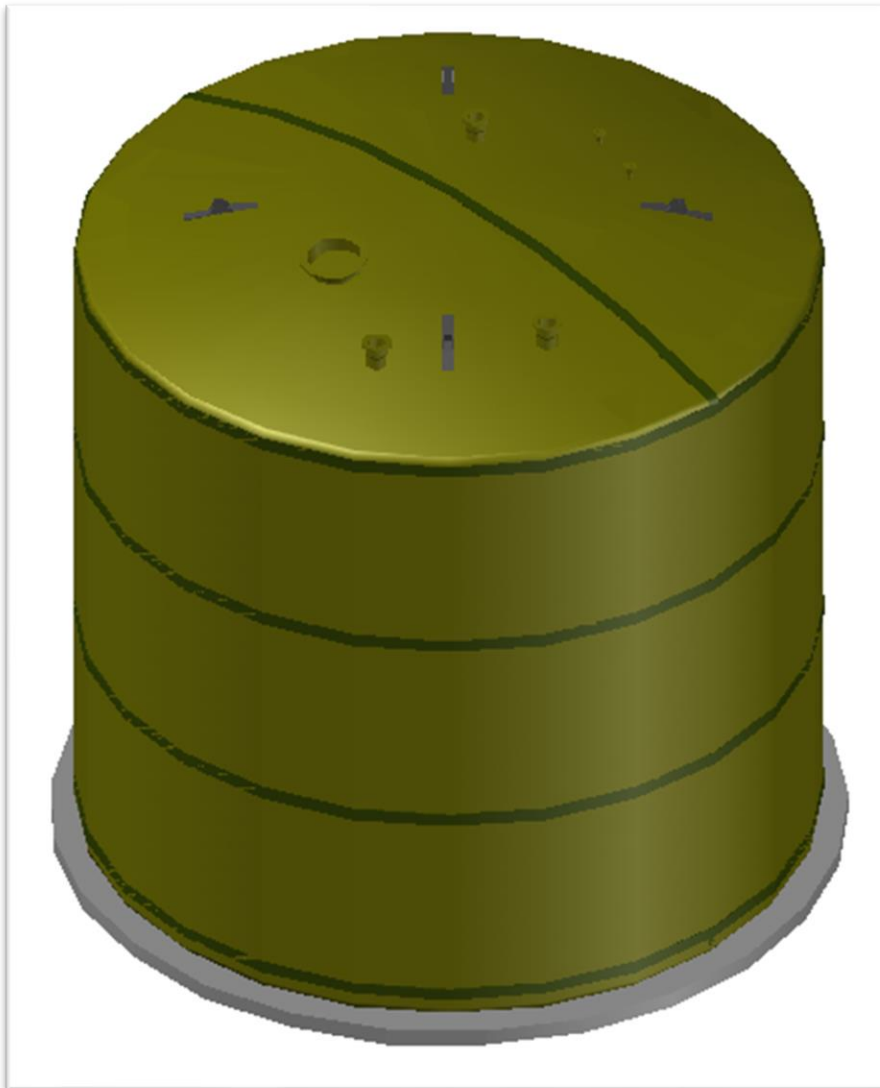
- The dish, top and middle mod are flown in from the lay-down area using a crane.
- The middle mod and bottom mod are aligned to the bottom mod's shoe horns.
- The middle mod to bottom mod and bottom mod to bottom are hot patched together.





BOTTOM ASSEMBLY AND BONDING

- The shoehorns are removed.
- The middle mod to bottom mod seam is then bonded to the required thickness and width per specification both outside and inside of the top mod and middle mod.
- Option: Any fittings and clips can be installed at this time on the bottom mod straight shell or can elect to be left until the entire tank is built.
- The floor seam is bonded to the required thickness and width per specification.





EXTERNAL PARTS BONDING

- Install any remaining manways, fittings, and clips to the straight shell.
- Install manway blind and davit.
- Bond on tank tie-downs.
- Install ladders and handrails, if required.
- Apply blinds and hydro-test tank for leaks.
- De-mobilize.

